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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/582,604	06/09/2006	Friedhelm Schmitz	2003P11480WOUS	2799
22116 7590 06/09/2009 SIEMENS CORPORATION INTELLECTUAL PROPERTY DEPARTMENT 170 WOOD AVENUE SOUTH ISELIN, NJ 08830				
EXAMINER				
BLACKWELL, GWENDOLYN				
ART UNIT		PAPER NUMBER		
1794				
MAIL DATE		DELIVERY MODE		
06/09/2009		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/582,604

**Applicant(s)**

SCHMITZ ET AL.

**Examiner**

GWENDOLYN BLACKWELL

**Art Unit**

1794

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 May 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 31-50 is/are pending in the application.
- 4a) Of the above claim(s) 49 and 50 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 31-48 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/S5108)  
Paper No(s)/Mail Date 6/9/09
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Election/Restrictions***

1. Applicant's election without traverse of Group I, claims 31-48, in the reply filed on May 22, 2009 is acknowledged. Claims 49-50 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

*The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.*

3. Claims 36-37 and 42-45 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 36-37 and 42-45 are considered indefinite as the base claim 31, includes the limitation of "[a] steam turbine component...". However, claim 36 indicates that the "component is a housing component of a gas or steam turbine" It is unclear how Applicant is specifically claiming a steam turbine component in the independent claim than indicate in a subsequent dependent claim that the component is used for a gas or steam turbine. To further prosecution, the component will be considered to be used in either a gas or steam turbine.

Claims 44 and 45 recites the limitation "the intermediate protective layer" in line 1. There is insufficient antecedent basis for this limitation in the claim. Claim 41 includes the limitations of an "intermediate protective layer" which is located beneath the thermal barrier

coating. As this seems to the same layer, the intermediate protective layer of 44 and 45 is being taken as the same layer having the same location. Clarification is required.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

*(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.*

5. Claims 31-32, 36, 38-39 and 48 are rejected under 35 U.S.C. 102(b) as being anticipated by United States Patent no. 5,190,598, Qureshi.

*Regarding claims 31-32 and 46*

Qureshi discloses steam turbine components having an improved erosion resistance coating comprised of a boride layer (TBC) coated with a sealing layer (erosion-resistant layer). The boride layer has a plurality of cracks (porous) which are sealed by the sealing layer, (columns 2-3, lines 64-5). The sealing layer includes a hard coating material such as chromium carbide and tungsten carbide, (column 4, lines 5-14). As the sealing layer protects the underlying porous layer, it would be expected that the sealing layer is less porous than the underlying layer absent an objective showing to the contrary, meeting the limitations of claims 31-32 and 46.

*Regarding claims 38-39 and 48*

The component can specifically be a rotating blade, (column 3, lines 20-27), meeting the limitations of claims 38 and 48.

The material of the base component is steel which is an iron based alloy, (column 3, lines 20-27), meeting the limitations of claim 39.

***Claim Rejections - 35 USC § 102/103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

*(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.*

7. Claims 31-32, 35, 38-39, and 46 are rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over United States Patent no. 4,446,199, Gedwill et al.

***Regarding claims 31- 32 and 46***

Gedwill et al disclose a substrate used as part of a turbine engine wherein the component is comprised of a metal substrate coated with a base coating (TBC) and a top coating (erosion-resistant). The top coating is an erosion resistant alloy of nickel, cobalt, or iron, (column 2, lines 12-18). As the top coating layer acts as a hot-corrosion/erosion resistant alloy, it would be expected to meet the limitation of having lesser porosity than the underlying base coat absent an objective showing to the contrary, meeting the limitations of claim 31-32 and 46.

***Regarding claims 35 and 38-39***

The top coat can have the formula of Ni-20Cr-5Al-0.3Y, (column 3, lines 31-39), which would correspond to a mixture of nickel-chromium with an admixture of nickel-aluminum, meeting the limitations of claim 35.

The coating can be used on turbine blades and vanes, (column 1, lines 14-23), meeting the limitations of claim 38.

The metal is based on nickel and cobalt based alloys, (column 1, lines 14-26), meeting the limitations of claim 39.

***Claim Rejections - 35 USC § 103***

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 31-34, 36-43, and 46-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over 4,405,284, Albrecht et al in view of United States Patent no. 5,350,599, Rigney et al further in view of United States Patent no. 6,302,318, Hasz et al.

*Regarding claims 31, 36-39, and 47*

Albrecht et al disclose a casing for a thermal turbomachine casing, utilized in a turbine, having a liner having a coating comprised of a bond coat, a ceramic layer formed thereon and a top metallic layer, (column 3, lines 14-26). The liner is used on components that include blades,

(column 1, lines 35-62). Albrecht et al does not specifically disclose that the top layer is less porous than the ceramic layer upon which it is formed.

Rigney et al disclose an erosion resistant thermal barrier coating utilized on turbine components wherein the coating is comprised of a bond coat, a porous sublayer, and a top sublayer that is less porous than the layer upon which it is formed, (columns 2-3, lines 66-45).

Albrecht et al and Rigney et al disclose analogous inventions related to erosion-resistant coatings formed on substrates which are used a turbine components. It would have been obvious to one skilled in the art at the time of invention to modify the coating of Albrecht et al with by ensuring that the top coating is less porous than the layer upon which it is formed in order to provide an erosion resistant layer that is more erosion resistant and thereby protects the underlying structure and substrate against erosion damage, (Rigney, column 3, lines 46-66), meeting the requirements of claims 31, 36-39, and 47.

*Regarding claims 32, 40-43, and 46*

The top layer (erosion-resistant) maybe selected from the group consisting of Ni-Cr alloy and Ni-BN metal ceramic compounds, (Albrecht, column 3, lines 21-23), meeting the requirements of claims 32 and 46.

The thermal barrier coating is zirconia, (Albrecht, column 3, lines 17-19), meeting the requirements of claim 40.

The bond coat can be a Ni-Cr-Al alloys (Albrecht) which would also include the Ni-Cr-Al-Y wherein Y can include yttrium, (Rigney, column 4, lines 51-65), meeting the requirements of claim 41.

As the coating meets Applicant's structural requirements it would be expected that the coating would also meet the operational limitations as exemplified absent an objective showing to the contrary, meeting the requirements of claims 42-43.

*Regarding claims 33-34*

Modified Albrecht et al does not disclose that the erosion resistant coating can be a mixture of chromium carbide and Ni-Cr.

Hasz et al disclose a wear resistant coating utilized on turbine components wherein the coating is the outermost coating and can be comprised of a mixture of chromium carbide and Ni-Cr, (column 2, lines 44-61).

Modified Albrecht et al and Hasz et al disclose analogous inventions related to the use of coatings on turbine components used to protect the substrate from erosion. It would have been obvious to one skilled in the art at the time of invention to modify the coating of modified Albrecht et al with that of Hasz et al in order to provide additional erosion support. Hasz et al is also used to show that it is known in the art to use the aforementioned composition as wear/erosion coatings on turbine components, meeting the requirements of claims 33-34.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GWENDOLYN BLACKWELL whose telephone number is 571-272-5772. The examiner can normally be reached on Monday - Friday.



If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on 571-272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/GWENDOLYN BLACKWELL/  
Primary Examiner, Art Unit 1794